

**FIG. 2-1****HT001****wt ORF (SEQ ID NO: 1)**

MQRPNNAHRISQPIRQIIYGLLLNASPHLDKTSWNALPPQPLAFSEVERINKNIRTSIIDAVELAKDHSLSRLTELSLRRRQMLLLETALKV  
KQTILEPIPTSLKLPPIAVSCYWLQHTETKAKLHHLQSLLLTMLVGPLIAIINSPGKEELQEDGAKMLYAEFQRVKAQTRLGTRLDLDTAHI  
FCQWQSCLQMGMVLYNQLLSTPLPEPDLTRLYSGSLVHGLCQQLLASTSVESLLSICPEAKQLYEYLFNATRSYAPAEIFLPKGRSNSK  
KKRQKKQNTSCSKNRGRRTTAHTKCWYEGNNRFGLLMVENLEEHSSEASNE

**(-1) ORF (SEQ ID NO: 2)**

MQRPNNAHRISQPIRQIIYGLLLNASPHLDKTSWNALPPQPLAFSEVERINKNIRTSIIDAVELAKDHSLSRLTELSLRRRQMLLLETALKV  
KQTILEPIPTSLKLPPIAVSCYWLQHTETKAKLHHLQSLLLTMLVGPLIAIINSPGKEELQEDGAKMLYAEFQRVKAQTRLGTRLDLDTAHI  
FCQWQSCLQMGMVLYNQLLSTPLPEPDLTRLYSGSLVHGLCQQLLASTSVESLLSICPEAKQLYEYLFNATRSYAPAEIFLPKGRSNSK  
KKGRRNRIPAVLRTEGEPLHTPSVGMRETTGLGC

**(+1)/(-2) ORF (SEQ ID NO: 3/118)**

MQRPNNAHRISQPIRQIIYGLLLNASPHLDKTSWNALPPQPLAFSEVERINKNIRTSIIDAVELAKDHSLSRLTELSLRRRQMLLLETALKV  
KQTILEPIPTSLKLPPIAVSCYWLQHTETKAKLHHLQSLLLTMLVGPLIAIINSPGKEELQEDGAKMLYAEFQRVKAQTRLGTRLDLDTAHI  
FCQWQSCLQMGMVLYNQLLSTPLPEPDLTRLYSGSLVHGLCQQLLASTSVESLLSICPEAKQLYEYLFNATRSYAPAEIFLPKGRSNSK  
KK(K)AEETEYQLF

**U79260****wt ORF (SEQ ID NO: 4)**

MGHPRAIQPSVFFSPYDVHFLLYPIRCPYLKIGRFHIKLGKHLFLFSFLFFFETQSHSVTRLECSGTISAHCNLCPLGSSNSPASASRV  
AGTAGTCRRAQLIFVFLAEMGFHHVGRDGLDLNLVIHPPRSPKALGLQA

**(-1) ORF (SEQ ID NO: 5)**

MGHPRAIQPSVFFSPYDVHFLLYPIRCPYLKIGRFHIKLGKHLFLFSFLFFF LRHSLTLSPGWSAVARSRLTATSASQVQVILLPQPPEW  
LGLQARAAAPS

**(+1)/(-2) ORF (SEQ ID NO: 6)**

MGHPRAIQPSVFFSPYDVHFLLYPIRCPYLKIGRFHIKLGKHLFLFSFLFFF(F)

**PTHL3****(wt) ORF (SEQ ID NO: 7)**

MQRRLVQQWSVAVFLLSYAVPSCGRSVEGLSRRLKRAVSEHQLLHDKGKSIQDLRRRFFLHHLIAEIHAEIRATSEVSPNSKPSNT  
KNHPVRFSGDDEGRYLTQETNKVETYKEQPLKTPGKKKKGKPGKRKEQEKKRRRTRSAWLDSGVTGSGLEGDHLSDTSTTSLELD  
SRTALLWGLKKKKENNRTHHMLMISLFKSPLLLL

**(-1) ORF (SEQ ID NO: 8)**

MQRRLVQQWSVAVFLLSYAVPSCGRSVEGLSRRLKRAVSEHQLLHDKGKSIQDLRRRFFLHHLIAEIHAEIRATSEVSPNSKPSNT  
KNHPVRFSGDDEGRYLTQETNKVETYKEQPLKTPGKKKKGKPGKRKEQEKKRRRTRSAWLDSGVTGSGLEGDHLSDTSTTSLELD  
SRTALLWGLKKK RKTTTEHHICN

**(+1)/(-2) ORF (SEQ ID NO: 9)**

MQRRLVQQWSVAVFLLSYAVPSCGRSVEGLSRRLKRAVSEHQLLHDKGKSIQDLRRRFFLHHLIAEIHAEIRATSEVSPNSKPSNT  
KNHPVRFSGDDEGRYLTQETNKVETYKEQPLKTPGKKKKGKPGKRKEQEKKRRRTRSAWLDSGVTGSGLEGDHLSDTSTTSLELD  
SRTALLWGLKKK(K) GKQKNTSYATNDLI

**TGFbRII****(wt) (SEQ ID NO: 10)**

MGRGLLRGLWPLHIVLWTRIASTIPPHVQKSVNNDMIVTDNNGAVKFPQLCKFCDFVRFSTCDNQKSCMSNCSITSICEKPQEVCAV  
WRKNDENITLETVCHDPKLPYHDFILEDAAAPKCMKEKKKGETFFMCSCSSDECNDNIIFSEEYNTSNPDLLLVIQVQTGISLLPPLG  
VAISVHIFCYRYVNRQQLSSTWETGKTRKLMFSEHCAILEDSDISSTCANNINHNTELLPIELDTLVGKGRFAEVYKAKLKQNTS  
EQFETVAVKIFPYEEYASWKTEKDIFSDINLKHENILOFLTAEERKTELKQYWLITAFHAKGNLQEYLRHVISWEDLRKLGSSSLARGI  
AHLHSDHTPCGRPKMPIVHRDLNSSLNVLKNDLTCCLCDFGLSLRLDPTLSVDDLANSGQVGTARYMAPEVLESRMNLENAESFKQT  
DVYSMALVLWEMTSRCNAVGEVKDYEPFPGSKVREHPCVESMKDNVLRDRGRPEIPSWFLNHQGIQMVCELTTECWDHDPPEARLT  
AQCVAERFSELEHLDRLSGRSCSEKIPEDGSLNTTK

**(-1) ORF (SEQ ID NO: 11)**

MGRGLLRGLWPLHIVLWTRIASTIPPHVQKSVNNDMIVTDNNGAVKFPQLCKFCDFVRFSTCDNQKSCMSNCSITSICEKPQEVCAV  
WRKNDENITLETVCHDPKLPYHDFILEDAAAPKCMKEKK SLVRLSSCVPALMSAMTTSSSQKNITPAILTCC

**(+1)/(-2) ORF (SEQ ID NO: 12/119)**

MGRGLLRGLWPLHIVLWTRIASTIPPHVQKSVNNDMIVTDNNGAVKFPQLCKFCDFVRFSTCDNQKSCMSNCSITSICEKPQEVCAV  
WRKNDENITLETVCHDPKLPYHDFILEDAAAPKCMKEKK(K) AW

**MACS****(wt) ORF (SEQ ID NO: 13)**

MGAQFSKTAAGAAAERPGEAAVASSPSKANGQENGHVKNVDASPAAAESGAKEELQANGSAPAADKEEPAAGSGAASPSS  
AEKGEPAAAAAPEAGASPVEKEAPAEGEAAEPGSATAAEGEAASASTSSPKAEDGATPSPSNETPKKKKKRFSFKKSKFLSGFS  
FKKNKKEAGEGGEAEAPAAEGGKDEAAGGAAAAAAEAGAASGEQAAPGEEAAAGGDPQEAQPEAAVAPEKPPASDE  
TKAAEEPSKVEEKAAEEAGASAAACEAPSAAGPGAPPEQEAPAEPPAAAAASSACAAPSQEAQPECSPPEAPAEAAE

**(-1) ORF (SEQ ID NO: 14)**

MGAQFSKTAAGAAAERPGEAAVASSPSKANGQENGHVKNVDASPAAAESGAKEELQANGSAPAADKEEPAAGSGAASPSS  
AEKGEPAAAAAPEAGASPVEKEAPAEGEAAEPGSATAAEGEAASASTSSPKAEDGATPSPSNETPKKK RSAPPSRSLSS

**(+1)/(-2) ORF (SEQ ID NO: 15)**



**FIG. 2-3****(+1)/(-2) 9er A-Repeat (SEQ ID NO: 27)**

MAGQQFQYDDSGNTFFYFLTSFVGLVIVPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLLPQPNIIPTVKKIVLLAGWALFLFL  
 AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
 GIALPAWIVDQKNSILVLLVYGLAFMVLVGVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
 APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEYEVMAVLGSFPY  
 VTMDIKSQVLDDSDSNITVGSVLTVLVKLTRQTMAEVEFEQESICAAEEQPAEDGQGETNKNRTKGGWQQ  
 KSKGPKKTAKSKK(K)ETFKKKTYTCAITTVKATETKAGKWSRWE

**(-1) 10er A-Repeat (SEQ ID NO: 28)**

MAGQQFQYDDSGNTFFYFLTSFVGLVIVPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLLPQPNIIPTVKKIVLLAGWALFLFL  
 AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
 GIALPAWIVDQKNSILVLLVYGLAFMVLVGVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
 APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEYEVMAVLGSFPY  
 VTMDIKSQVLDDSDSNITVGSVLTVLVKLTRQTMAEVEFEQESICAAEEQPAEDGQGETNKNRTKGGWQQ  
 KSKGPKKTAKSKKKPLK(K)NLHLCYYHSQSNRNKSQMESLGMKLQ

**(+1)/(-2) 10er A-Repeat (SEQ ID NO: 29)**

MAGQQFQYDDSGNTFFYFLTSFVGLVIVPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLLPQPNIIPTVKKIVLLAGWALFLFL  
 AYKVSCTDREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
 GIALPAWIVDQKNSILVLLVYGLAFMVLVGVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
 APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEYEVMAVLGSFPY  
 VTMDIKSQVLDDSDSNITVGSVLTVLVKLTRQTMAEVEFEQESICAAEEQPAEDGQGETNKNRTKGGWQQ  
 KSKGPKKTAKSKKKPLK(K)TYTCAITTVKATETKAGKWSRWE

**Caspase 5****(wt)ORF (SEQ ID NO: 30)**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLVPNTDQKSTSVKKDNHKKKTVMLEYLGKDVHGVFNLYAKHDVLTKEEEKKKYY  
 DAKIEDKALILVDSLKNRVAHQMFQTLLNMDQKITSVKPLLQIEAGPPESAESTNKLCPREEFLRLCKKNHDEIYPIKKREDRRRLA  
 LIICNTKFDHLPARNGAHYDVGMRLLQGLGYTVVDEKNLTARDMESVLRFAFAARPEHKSSDSTFLVLMHSGILEGICGTAHKKKKPD  
 VLLYDTIFQIFNNRNCLSLDKPKVIVQACRGEKHGELWVRDSPASLAVISSQSENLEADSVCKIHEEKDFIAFCSSSTPHNVSWRDR  
 TRGSIFITELITCFQKYSCCCHLMEIFRKVQKSFEVPAQAQMPTIERATLTRDFYLFPGN

**(-1)ORF (SEQ ID NO: 31)**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLVPNTDQKSTSVKKDNHKKKQLRCWNTWAKMFFMVFLIHWQNTME

**(+1)/(-2)ORF (SEQ ID NO: 32)**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLVPNTDQKSTSVKKDNHKK(K)NS

**AIM2****(wt)ORF (SEQ ID NO: 33)**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNMYLLAKRLQEEKEKVDKQ  
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF  
 HATVATEKEFFVVKVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV  
 VQKVTEKKKILFDLSDNTGKMEVLGVRNEDTMCKEKGDKVRLTFFTL SKNGEKLQLTSGVHSTIKVIKAKKKT

**(-1)ORF (SEQ ID NO: 34)**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNMYLLAKRLQEEKEKVDKQ  
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF  
 HATVATEKEFFVVKVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV  
 VQKVTEKKKILFDLSDNTGKMEVLGVRNEDTMCKEKGDKVRLTFFTL SKNGEKLQLTSGVHSTIKVIKAKKKHREVKRTNSSQLV

**(+1)/(-2)ORF (SEQ ID NO: 35)**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNMYLLAKRLQEEKEKVDKQ  
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF  
 HATVATEKEFFVVKVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV  
 VQKVTEKKKILFDLSDNTGKMEVLGVRNEDTMCKEKGDKVRLTFFTL SKNGEKLQLTSGVHSTIKVIKAKKK(K)NIEK

**SLC23A1****(wt)ORF (SEQ ID NO: 36)**

MMGIGKNTTSKSMAGSSTEGKYEDEAKHPAFFTLPPVINGGATSSGEQDNEDTELMAYTTENGIAEKSSLAETLDSTGSLDPQRS  
 DMIYTIEDVPPWYLCIFLGLQHYLTCSFGTIAVPFLLADAMCVGYDQWATSQLIGTIFFCVGITLLQTTFGCRPLPFQTSASAFLAPARA  
 ILSLDKWKCNNTDVSANGTAELLHTEHIWYPRIREIQGAIIMSSSIEVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW  
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILAILVSWLLCFIFTVTDVFPDPSTKYGFYARTDARQGVLLVAPW  
 FKVPYFPQWGLPTVSAAGVIGMLS AVVASIIESIGDYACARLSCAPPPPIHAINRGIFVEGLSCVLDGIFGTGNGSTSSPNIGVLGITK  
 VGSRRVIQCGAALMLALGMIGKFSALFASLPDPVLGALFCTLFGMITAVGLSNLQFIDLNSSRNLVFLGFSIFFGLVLPYLRQNPLVTGI  
 TGIDQVLNVLLTAMFVGCVAFILDNTIPGTPEERGIRKWKKGVGKGNKSLDGMESYNLPFGMNIKKYRCFSYLPISPTFVGTYWK  
 GLRKSNSNRSSDEDSQATG

**(-1)ORF (SEQ ID NO: 37)**

MMGIGKNTTSKSMAGSSTEGKYEDEAKHPAFFTLPPVINGGATSSGEQDNEDTELMAYTTENGIAEKSSLAETLDSTGSLDPQRS  
 DMIYTIEDVPPWYLCIFLGLQHYLTCSFGTIAVPFLLADAMCVGYDQWATSQLIGTIFFCVGITLLQTTFGCRPLPFQTSASAFLAPARA  
 ILSLDKWKCNNTDVSANGTAELLHTEHIWYPRIREIQGAIIMSSSIEVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW  
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILAILVSWLLCFIFTVTDVFPDPSTKYGFYARTDARQGVLLVAPW  
 FKVPYFPQWGLPTVSAAGVIGMLS AVVASIIESIGDYACARLSCAPPPPISTQ

**(+1)/(-2)ORF (SEQ ID NO: 38)**

FIG. 2-4

MMGIGKNTTSSKMEAGSSTEGKYEDEAKHPAFFTLPVVINGGATSSGEQDNEDTELMAIYTTENGIAEKSSLAETLDSTGSLDPQRS  
 DMIYTTIEDVPPWYLICIFLGLQHYLTFCFSGTIAVPFLLADAMCVGYDQWATSQLIGTIFFCVGITLLQTTFGCRLPLFQTSFAFLAPARA  
 ILSLDKWKCNNTDVSANGTAELLHTEHIWYPRIREIQGAIIMSSLIEVVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW  
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILVSVLLCFIFTVDVFPDSTKYGFYARTDARQGVLLVAPW  
 FKVPYPFQWGLPTVSAAGVIGMLSAAVVASIIESIGDYYACARLSCAPP

(P)HPRNKQGNFRGRPLCS

### ABCF1

(wt)ORF (SEQ ID NO: 39)

MPKAPKQQPPEPEWIGDGESTSPSDKVVKKGKKDKKIKKTTFFELAVEDKQAGEEEKVLKEKEQQQQQQQQQQKKKRDTRKGRR  
 KKDVDDDDGEEKELMERLKKLSVPTSDEEDEVPAKPRGGKKTGGNVFAALIQDQSEEEEEEEKHPPKPAKPEKNRINKAVSEEQQ  
 PALKGKKGKEEKSKGKAKPQNKFAALDNEEEDKEEIIKEKPPKQGKEKAKKAEQMEYERQVASLKAANAENDFSVQAEMSSR  
 QAMLENASDIKLEKFSISAHGKELFVNADLYIVAGRRYGLVGPNGKGKTTLLKHIANRALSIPPIDVLLCEQEVVADETPAVQAVLRAD  
 TKRLKLLLEEERRLQGQLEQGGDDTAERLEKVEELRATGAAAAEAKARRILAGLGFDPQMNRPTQKFSGGWVRVSLARALFMEP  
 TLLMLDEPTNHLDLNAVIWLNLYLQGWRTLLIVSHDQGLDDVCTDIIHLDAQRLHYRGNYMTFKKMYQQKQKELLKQYEQKQKLL  
 KELKAGGKSTKQAEKQKEALTRKQKQKRRKNQDEESQEAPELLKRPKEYTVRFTFPDPPPLSPPVLGLHGVTFGYQQGKPLFKNL  
 DFGIDMDSRICIVGPNVGVKSTLLLLLTGKLTPTHGEMRKNHRLKIGFFNQQAELRMEETPTTEYLQRGFNLPYQDARKCLGRFGL  
 SHAHTIQICKLSGGQKARVFAELACREPDVILDEPTNNDLIESIDALGEAINEYKGAIVVSHDARLITETNCQLVWVVEEQSVSQIDG  
 DFEDYKREVLEALGEVMVSRPRE

(-1)ORF (SEQ ID NO: 40)

MPKAPKQQPPEPEWIGDGESTSPSDKVVKKGKKDKKIKKTTFFELAVEDKQAGEEEKVLKEKEQQQQQQQQQQKKKSEIPEKAGGR  
RMWMMMEKRKSSWSVLRSSQCQPMRRMKYPPQNPAGRKPVRVVMFLQP

(+1)/(-2)ORF (SEQ ID NO: 41)

MPKAPKQQPPEPEWIGDGESTSPSDKVVKKGKKDKKIKKTTFFELAVEDKQAGEEEKVLKEKEQQQQQQQQQQKK(K)ARYPKRQA  
EEGCG

### HSPC259

(wt)ORF (SEQ ID NO: 42)

SPDYFPQISSQFGTVEK  
 MEKIFISSSTKAEGKISPFAPINTQAPPEKGKEAVVQEPERSWFQTKKEERKKEKIAKALQEFDLALRGKKKRRKKFMKDAKKKGEMT  
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR  
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLCLFSICLKKKQKQKTTWCGGMVRSYFPKHVCQSPFLLISFHMTIL  
 NGSIFGKRE

(-1)ORF (SEQ ID NO: 43)

MEKIFISSSTKAEGKISPFAPINTQAPPEKGKEAVVQEPERSWFQTKKEERKKEKIAKALQEFDLALRGKKKRRKKFMKDAKKKGEMT  
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR  
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLCLFSICLKKNKNKKQHFGVWVWYVAIFLSMSVNLPS

(+1)/(-2)ORF (SEQ ID NO: 44)

MEKIFISSSTKAEGKISPFAPINTQAPPEKGKEAVVQEPERSWFQTKKEERKKEKIAKALQEFDLALRGKKKRRKKFMKDAKKKGEMT  
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR  
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLCLFSICLKK(K)TKTKNNTLVWVWYGT

### Bax

(wt)ORF (SEQ ID NO: 45)

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGGEAPELALDPVPQDASTKKLSECLKRIGDELDSNMELQRMIAAVDTD  
 SPREVFFRVAADMFSDGNFNVGRVVALFYFASKLVLKALCTKVPELIRTIMGWTLDFLRERLLGWIQDQGGWDGLLSYFGTPTWQT  
 VTIFVAGVLTASLTIWKKMG

(-1)ORF (SEQ ID NO: 46)

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGGRHPSWPWTRCLMRPPRS

(+1)/(-2)ORF (SEQ ID NO: 47)

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGG(G)GTRAGPGPGASGCVHQEAERVSQAHRGRTGQ

### TCF6L1

(wt)ORF (SEQ ID NO: 48)

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSSKEQLPIFKAQNPDAKTTELIRRIAQR  
 WRELPSKKKIYQDAYRAEWQVYKEEISRFKEQLTPSQIMSLEKEIMDKHLKRKAMTKKKELTLGKPKRPRSAYNVYVAERFQEAQ  
 GDSPQEKLTVKENWKNLSDSEKELYQHAKEDETRYHNEMKSWEEQMIIEVGRKDLLRRTIKKQRKYGAEEC

(-1)ORF (SEQ ID NO: 49)

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSSKEQLPIFKAQNPDAKTTELIRRIAQR  
 WRELPSKKKIYQDAYRAEWQVYKEEISRFKEQLTPSQIMSLEKEIMDKHLKRKAMTKKKS

(+1)/(-2)ORF (SEQ ID NO: 50)

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSSKEQLPIFKAQNPDAKTTELIRRIAQR  
 WRELPSKKKIYQDAYRAEWQVYKEEISRFKEQLTPSQIMSLEKEIMDKHLKRKAMTKK(K)RVNTAWKTKTSFSL

### FTL3L

(wt)ORF (SEQ ID NO: 51)

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSDYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT  
 VAGSKMQGLLERVNTIEHFVTKCAFQPPPSCLRFVQTNISRLQETSEQLVALKPWITRQNFSCRLELCQCPDSSTLPPPWSPRPLE  
 ATAPTAPQPLLLLLLLPVGLLLAAWCLHWQRTTRRTPRPGEQVPPVPSQDLLLLVEH

(-1)ORF (SEQ ID NO: 52)

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSDYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT  
 VAGSKMQGLLERVNTIEHFVTKCAFQ  
 PPPAVFASSRPTSPASCRRPPSSWWR

FIG. 2-5

**(+1)/(-2)ORF (SEQ ID NO: 53)**

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSDYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT  
VAGSKMQGLLERVNTIEHFVTKCAFQ  
PP(P)QLSSLRPDQHLPPPAGDLRAAGGAEALDHSPPELLPVGA AVSAR

**OGT****(wt)ORF (SEQ ID NO: 54)**

MLQGHFWLVREGIMISPSSPPPNLFFFPLQIFPFPFTSFPSHLLSLTPPKACYLKAJETQPNFAVAWSNLGCVFNAQGEIWLAIHFFE  
KAVTLDPNFLDAYINLGNVLKEARIFDRAVAAYLRALSLSPNHAVVHGNLACVVEEQGLIDLAIDTYRRAIELQPHFPDAYCNLANALKE  
KGSVAEEDCYNTALRLCPHADSLNNLANIKREQGNEEAVRLYRKALEVFPEFAAAHSNLASVLQQQKGLQEALMHYKEAIRISPTF  
ADAYSNMGNLTKEMQDVQGALQCYTRAIQINPAFADAHSNLASIHKDSGNIPEAIASYRTALKLKPDPDAYCNLAHCLQIVCDWTDY  
DERMKKLVSIADQLEKNRLPSVHPHSMYPLSHGFRKAIAERHGNLCLDKINVLHKPPYEHKDLKLSGRLRVGVYSSDFGNHPT  
SHLMQSPGPMHNPDKFEVFCYALSPDDGTNFRVKVMAEANHFIDLSQIPCNKGKAADRIHQDGIHILVNMNGYTKGARNELFALRPAPI  
QAMWLGYPGTSGALFMDYIITDQETSPAEEVAEQYSEKLAYMPHTFFIGDHANMFPHLKKKAVIDFKSNGHIYDNRIVLNGIDLKAF LDS  
LPDVKIVKMKCPDGGDNADSSNTALNMPVIMNTIAEAVIEMINRGQIQITINGFSISNGLATTQINNKAATGEEVPTIIVTTRSQYGLP  
EDAIVYCNFNLYKIDPSTLQMWANILKRVPNVSVLWLLRFPVAVGEPNIQQYQAQNMGLPQNRIFSPVAPKEEHVRRGQLADVCLDTPL  
CNGHTTGMDVLWAGTPMVTMPGETLASVAASQLTCLGCELIANKRQEYEDIAVKLGTDLLEYLKKVRGKVVWQRISSPLFNTKQYT  
MELERLYLQMWVEHYAAGNKPDMIKPVEVETESA

**(-1)ORF (SEQ ID NO: 55)**

MLQGHFWLVREGIMISPSSPPPNLFFSLYKFSFPFLPPFPPIFFH

**(+1)/(-2)ORF (SEQ ID NO: 56)**

MLQGHFWLVREGIMISPSSPPPNLFF(F)PFTNFPLSLYLLSLPSSFINPS

**ELAVL3****(wt)ORF (SEQ ID NO: 57)**

MESQVGGGPAGRPAQRPLLGTNGATDDSKTNLIVNYPQNMTQDEFKSLFGSIGDIESCKLVRDKITGQSLGYGFVNYSDPNADKA  
INTLNLGLKQTKTIKVSYPSSASIRDANLYVSGLPKTMSSQKEMEQLFSQYGRITSRLVDQVTGVSRGVGFIRFDKRIEAEAAIKGLN  
GQKPLGAREPITVKFANNPSQKTGQALLTHLYQSSARRYAGPLHHQTQRFRLDNLNLMAYAVKRFSPIADGMSGLAGVGLSGGAAG  
GWCIFVYNLSPEPDQSVLWQLFGPFGAVTNVKVIRDFTTNKCKGFGFMTMTNYDEAAMAIASLNGYRLGQRLVQVSFKTSKQHKHA

**(-1)ORF (SEQ ID NO: 58)**

MESQVGGGARPAGLPNGHSLVQMEPLTARTSSSTTCPT

**(+1)/(-2)ORF (SEQ ID NO: 59)**

MESQVGG(G)PGRPACPTATPWYKWSH

**MAC30X****(wt)ORF (SEQ ID NO: 59)**

LFSHQVRVQAQPTDYGGSFTRRCVEWLLGLYFLSHIPITLFMDLQAVVPRELYPVEFRNLLKWYAKEFKDPLLQEPPAWFKSFLFCELV  
FQLPFFPIATYAFKLGSCKWIRTPAIIYSVHTMTLILILSTFLFEDFSKASGFKGQRPETLHERLTLVSVYAPYLLIPFILLIFMLRSPYYKY  
EEKRKKK

**(-1)ORF (SEQ ID NO: 61)**

LFSHQVRVQAQPTDYGGSFTRRCVEWLLGLYFLSHIPITLFMDLQAVVPRELYPVEFRNLLKWYAKEFKDPLLQEPPAWFKSFLFCELV  
FQLPFFPIATYAFKLGSCKWIRTPAIIYSVHTMTLILILSTFLFEDFSKASGFKGQRPETLHERLTLVSVYAPYLLIPFILLIFMLRSPYYKY  
EEKRKKKNEGNHWPVEMPTGWLLVGYIQEHGSEPTSSAAFETLAAMHKS KMVSGTMSNP HLLPFFFF

**(+1)/(-2)ORF (SEQ ID NO: 62)**

LFSHQVRVQAQPTDYGGSFTRRCVEWLLGLYFLSHIPITLFMDLQAVVPRELYPVEFRNLLKWYAKEFKDPLLQEPPAWFKSFLFCELV  
FQLPFFPIATYAFKLGSCKWIRTPAIIYSVHTMTLILILSTFLFEDFSKASGFKGQRPETLHERLTLVSVYAPYLLIPFILLIFMLRSPYYKY  
EEKRKK(K)MKETTIGPG

**SLC4A3****(wt)ORF (SEQ ID NO: 63)**

MANGVIPPGGASPLPQVRVPLEEPPLSPDVEEEDDDLGKTLAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRHTSHHHTHPLSA  
RLPPPHKLRLRPPTSARHTRRKRRKKEKTSAPPSEGTPIQEEGGAGVDEEEEEEEEEGESEAEPEVPPPSGTPQKAKFSIGSDEDD  
SPGLPGRAAVTKPLPSVGPHTDKSPQHSSSSPSPRARASRLAGEKSRPWSPSASYDLRERLCPGSALGNPGGPEQQVPTDEAEAQ  
MLGSADLDDMKSHREDNPGVRRHLVKKPSRTQGGGRGSPGLAPILRRKKKKKKLDRRPHEVFVELNELMLDRSQEPHWRETARW  
IKFEEDVEEETERWGKPHVASLSFRSLELRLRTIAHGAALLDLEQTTLPGLAHLVETMIVSDQIRPEDRASVLRLLLLKHSHPNDDKDS  
GFFPRNPSSSSMNSVLGNHHTPTSHGPDGAVPTMADDLGEPAWPHDPDAKEKPLHMPGGDGHGKSLKLEKIPEDAEATVVL  
VGCVPFLEQPAAAFVRLNEAVLLESVLEVPVVRFLVMLGPSHTSTDYHELGRSIATLMSDKLFHEAAYQADDRQDLLSAISEFLDG  
SIVIPPSEVEGRDLLRSVAAFQRELLRKRREREQTKVEMTTTGGYTAPGKLSLELGGSEATPEDDPLLRTGSVFGGLVRDVRRRYP  
HYPDLRLDALHSQCVAALVFIYAALSPAITFGGLLEKTEGLMGVSELIVSTAVLGVLFSLLGAQPLLVGFSGPLLVFEEAFFKFCRA  
QDLEYLTGRVWVGLWLVFVLALVAEAGSFLVRYISPFTQEIFAFLISLIFIYETFYKLYKVFTTEHPLLPFPYPEGAGLEGLAAGLEPNGS  
ALPPTGPPSPRNQPNNTALLSLILMLGTFFIAFFLRKFRNSRFLGGKARRIIGDFGIPISILVMVLVDYSITDTYTQKLTVP TGLSVTSPDK  
RSWFIPPLGSARPPPPWMMVAAVALLVILIFMETQITALIVSQARRLLKSGSGFHLDLLIGSLGGGLGFLPWLTAATVRSVTHV  
NALTMRTAIAPGDQVQIEVREQRVTGVLIALSLVGLSIVMGAVLRRILAVLFGFLYMGVTSLSGQILSQRLLLILMPAKHHPEQPYVT  
KVKTWRMHFLTQIQLGCIALLWVVKSTAASLAPFLLLLTVPLRHCLLPRLFQDRELQALDSEDAEPNDFEDGQDEYNELHMPV

**(-1)ORF (SEQ ID NO: 64)**

MANGVIPPGGASPLPQVRVPLEEPPLSPDVEEEDDDLGKTLAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRHTSHHHTHPLSA  
RLPPPHKLRLRPPTSARHTRRKRRKKEKTSAPPSEGTPIQEEGGAGVDEEEEEEEEEGESEAEPEVPPQGP HRRQSSPLEVTRM  
TVQASLGGLSPSPCPRWAHTLTRAPSTPAAPPAGPGPPDSLGRKAGPGAHRPVMTCGSDCAQAVPWATQVVQSSRC PQMRRR  
PRCWLTQWTT

**(+1)/(-2)ORF (SEQ ID NO: 65)**

MANGVIPPGGASPLPQVRVPLEEPPLSPDVEEEDDDLGKTLAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRHTSHHHTHPLSA  
RLPPPHKLRLRPPTSARHTRRKRRKKEKTSAPPSEGTPIQEEGGAGVDEEEEEEEEEGESEAEPEVPP(P)LRDPTEGKVLHWK

FIG. 2-6

**PRKDC****(wt)ORF (SEQ ID NO: 66)**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVALALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL  
 CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLQTFRRSSRLMDEFKIGELFSKFYGEALAKKKIPDTVLEKVEYELLGGL  
 GEVHPSEMINNAENLFRALGELKTQMTSAVREPKLPLVLAGCLKGLSSLLCNFTKSMEEDPQTSREIFNFVLKAIRPQIDLKRYAVPSA  
 GLRLFALHASQFSTCLLDNYVSLFEVLLKWCANTVELKKAALSALESFLKQVSNMVAKNAEMHKNLQYFMEQFYGIIRNVDSNNKE  
 LSAIRGYGLFAGPCKVINAKDVDFMYVELIQRCCKQMFLTQTDGDDRUYQMPSPFLQSVASVLLYLDTVPEVYTPVLEHLVVMQIDSFP  
 QYSPKMLVCCRAIVKVLALAAKGPVLRNCISTVHQGLIRICSKPVLPKGPESESEDRASGEVRTGKWVPTYKYDYVDFRHL  
 SSDQMMDSILADEAFFSVNSSSESLNHLLYDEFVKSVLKIVEKLDLTLEIQTVEQENGDEAPGVWMIPTSDPAANLHPAKPKDFSAFI  
 NLVEFCREILPEKQAEFFEPWVYSFSYELILQSTRPLISGFYKLLSITVRNAKKIKYFEGS

**(-1)ORF (SEQ ID NO: 67)**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVALALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL  
 CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLQTFRRSSRLMDEFKIGELFSKFYGEALAKKKYQIQF

**(+1)/(-2)ORF (SEQ ID NO: 68)**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVALALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL  
 CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLQTFRRSSRLMDEFKIGELFSKFYGEALAKKK(K)NTRYSEFRKS/

**UVRAG****(wt)ORF (SEQ ID NO: 69)**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRLRHLRNLIAARNIVNRNGHQLLDITYFTLHLCSTEKIYKEFYRSEVIKN  
 SLNPTWRSDFGIMPDRDLTSSVCFVVKIWGGKENIYQLLIEWKVCGLDGLKYLGGQIHARNQNEIIFGLNDGYYGAPFEHKGYSNAQK  
 TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQVQIGKEIEEKLRLTSTSNELKKKSECLQLKILVLQNELEKQKALGREVALLH  
 KQQLAQDKGSFAESAHLKLQKQESLNLKRECKTAKRELFLKTNALQTLRQRLSEL.SYIYPIDLNEHKDYFVCGVKLPNSDFQAK  
 DDGSIADVALGYTAHLVSMISFFLQVPLRYPPIHKGSRSTIKDNINDKLTEKEREFPYLPKGGEKLQFDYGVYLLNKNIAQLRYQHGLGTP  
 DLRLQTLPLNKNFMELHGLMVRCDRHHTSSAIPVPKRQSSIFGGADVGFSGGIPSPDKGHRKRASSENERLQYKTPPPSYNSALAQPVT  
 TVPSMGETERKITSLSSSLDTSDFSKENKKKGEDLVGSLNGGHANVHPSQEQQEALSGHRATVNGTLLPSEQAGSASVQLPGEFH  
 PVSEALCCTVEQAEIIGLEAQVSPQVIS

**(-1)ORF (SEQ ID NO: 70)**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRLRHLRNLIAARNIVNRNGHQLLDITYFTLHLCSTEKIYKEFYRSEVIKN  
 SLNPTWRSDFGIMPDRDLTSSVCFVVKIWGGKENIYQLLIEWKVCGLDGLKYLGGQIHARNQNEIIFGLNDGYYGAPFEHKGYSNAQK  
 TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQVQIGKEIEEKLRLTSTSNELKKKVNACS

**(+1)/(-2)ORF (SEQ ID NO: 71)**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRLRHLRNLIAARNIVNRNGHQLLDITYFTLHLCSTEKIYKEFYRSEVIKN  
 SLNPTWRSDFGIMPDRDLTSSVCFVVKIWGGKENIYQLLIEWKVCGLDGLKYLGGQIHARNQNEIIFGLNDGYYGAPFEHKGYSNAQK  
 TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQVQIGKEIEEKLRLTSTSNELKKK(K)

**MSH3****(wt)ORF (SEQ ID NO: 72)**

MSRRKPASGGGLAASSAPARQAVLSRFFQSTGSLKSTSSSTGAADQVDPGAAAAAAAAAAAAAPPAPPAPAFPPQLPPHVATEIDRR  
 KKRPLENDGPVKKKVKVQKQEGGSDLGMSGNSEPKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVLPKCTDFDDI  
 SLLHAKNAVSSDSKRQINQKDTTFLDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG  
 EDAEIAARELNICHLDHNFMTASIPTHRLFVHVRRLVAKGYKGVVQKTETAALKAIGDNRSSLFSRKLALYTKSTLIGEDVNPLIKLD  
 DAVNVDEIMTDTSTSYLLCISENKENVRDKKGNIFIGVGVQPATGEVVFDSFQDSASRSELETRMSSLPQVELLLPSALSEQTEALIH  
 RATSVSVQDDIRIRVERMDNIYFEYSHAFQAVTEFYAKDTVDIKGSQIISGIVNLEKPVICSLAAIKYLKEFNLEKMLSKPENFKQLSSKM  
 EFMTINGTTLRLNLEIQNQDTMDKTKGSLWVLDHTKTSFGRRRLKKWVTQPLLKLREINARLDAVSEVLHSESSVFGQIENHLRKLPI  
 GRGLCSYHKKCSTQEFFLIVKTLYHLKSEFQAIIPAVNSHIQSDLRVILEIPELLSPVEHYLKILNEQAQKVGDKTELFKDLSDFLPIKK  
 RKDEIQGVDEIRMLHLEIRKILKNPSAQYVTVSGQEFMIEIKNSAVSCIPTDWWKVGSTKAVSRFHSPFIVENYRHLNQLREQLVDCS  
 AEWDLFEKFESEHYHSLCKAVHHLATVDCIFSLAKVAKQGDYCRPTVQEERKIVIKNGRHPVIDVLLGEQDQYVNNDTLSDSERVM  
 IITGPNMGGKSSYIKQVALITIMAIQISYVPAEEATIGIVDGIFTRMGAADNIYKGRSTFMEELTDTAEIIRKATSQSLVILDELGRGTSTH  
 DGIAIAYATLEYFIRDVKSLLTFVTHYPPVCELEKNYSHQVGNVHMGFLVSEDESKLDPGTAEQVPDFVTFLYQITRGIAARSYGLNVA  
 KLADVPGEILKKAHKSKELEGLINTKRRLKYFAKLWTMHNADQLQKWTEEFNMEETQTSLLH

**(-1)ORF (SEQ ID NO: 73)**

MSRRKPASGGGLAASSAPARQAVLSRFFQSTGSLKSTSSSTGAADQVDPGAAAAAAAAAAAAAPPAPPAPAFPPQLPPHVATEIDRR  
 KKRPLENDGPVKKKVKVQKQEGGSDLGMSGNSEPKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVLPKCTDFDDI  
 SLLHAKNAVSSDSKRQINQKDTTFLDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG  
 EDAEIAARELNICHLDHNFMTASIPTHRLFVHVRRLVAKGYKGVVQKTETAALKAIGDNRSSLFSRKLALYTKSTLIGEDVNPLIKLD  
 DAVNVDEIMTDTSTSYLLCISENKENVRDKK(RATFLLALWECSLPQARCLIVSRTLLLVQS

**(+1)/(-2)ORF (SEQ ID NO: 74)**

MSRRKPASGGGLAASSAPARQAVLSRFFQSTGSLKSTSSSTGAADQVDPGAAAAAAAAAAAAAPPAPPAPAFPPQLPPHVATEIDRR  
 KKRPLENDGPVKKKVKVQKQEGGSDLGMSGNSEPKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVLPKCTDFDDI  
 SLLHAKNAVSSDSKRQINQKDTTFLDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG  
 EDAEIAARELNICHLDHNFMTASIPTHRLFVHVRRLVAKGYKGVVQKTETAALKAIGDNRSSLFSRKLALYTKSTLIGEDVNPLIKLD  
 DAVNVDEIMTDTSTSYLLCISENKENVRDKK(K)QGHFYWHCGSAACHRRGCV

**ACVR2****(wt) ORF (SEQ ID NO: 107)**

MGAAAKLAFVFLISCSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL  
 DDINCYDRDT CVEKKDSPEV YFCCCEGNMC NEKFSYFPEM EVTQPTSNPV TPKPPYYNIL LYSVLPLMLI AGIVICAFWV

## FIG. 2-7

YRHHKMAYPP VLVPTQDPGP PPPSPLLGLK PLQLLEVkar GRFGCVWKAQ LLNEYVAVKI FPIQDKQSWQ NEYEVYSLPG  
MKHENILQFI GAEKRGTSVD VDLWLITAFH EKGSLSDFLK ANVVSWNELC HIAETMARGL AYLHEDIPGL KDGHKPAISH  
RDIKSKNVLL KNNLTACIAD FGLALKFEAG KSAGDTHGQV GTRRYMAPEV LEGAINFQRD AFLRIDMYAM GLVLWELASR  
CTAADGPVDE YMLPFEEIEG QHPSLEDME VVHKKKRPV LRDYWQKHAG MAMLCETIEE CWDHDAEARL SAGCVGERIT  
QMQRLTNIIT TEDIIVVTM VTNVDFPPKE SSL\*

A8, Pos. 451: -1 ORF (Mut.rate 16.3%) (SEQ ID NO: 108)

MGAAAKLAFa VFLISCSsGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL  
DDINCYDRTD CvekKTALKY IFVAVRAICV MKSFLIFRRW KSHSLPQIQL HLSHPITTSC SIPWCHLC\*

A8 Pos. 1476: -1 (Mut.rate 81.6%) (SEQ ID NO: 109)

MGAAAKLAFa VFLISCSsGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL  
DDINCYDRTD CvekKDSPEV YFCCCEGNMC NEKFSYFPEM EVTQPTSNPV TPKPPYYNII LYSLVPLMLI AGIVICAFVW  
YRHHKMAYPP VLVPTQDPGP PPPSPLLGLK PLQLLEVkar GRFGCVWKAQ LLNEYVAVKI FPIQDKQSWQ NEYEVYSLPG  
MKHENILQFI GAEKRGTSVD VDLWLITAFH EKGSLSDFLK ANVVSWNELC HIAETMARGL AYLHEDIPGL KDGHKPAISH  
RDIKSKNVLL KNNLTACIAD FGLALKFEAG KSAGDTHGQV GTRRYMAPEV LEGAINFQRD AFLRIDMYAM GLVLWELASR  
CTAADGPVDE YMLPFEEIEG QHPSLEDME VVHKKKGLF\*

FLJ11053, A11 Pos. 1695, Mut.rate 52.2%

wt ORF (SEQ ID NO: 110)

MVLRKLSKkd VTTKLKAMQE FGTMCterDt ETVKGVLPYw PRIFCKISLD HRRVREAtQ QAFekLTlKv KKQLAPYlKS  
LMGYWLMAQC DTYTPAAFAA KDAFEAAFPp SKQPEAIaFc KDEITSVLQD HLIKETPDTL SDPQTVPeeE REAKFYRVVt  
CSLLALKRLL CLLPDnELDS LEEKFKSLLS QNKFWKYGKH SVPQIRsAYf ELVSALCQRI PQLMKEEaSk VSPSVLLSiD  
DSDPIVCPAL WEAVLYTLTt IEDCWLHVNA KKSvFPKLST VIREGGRGLA TVIYPYLLPF ISKLPHSiTn PKLDFFKnfL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHqGL FNHLAETLSS  
WEAKADTEKD EKTAHNLEnv LIHFWERLSE ICvAKISEPE ADVESVLGVS NLLQVLQKPK SSKSSKKKkN GKVRFADEIL  
ESNKENEKCV SSEGEKIEGW ELTTEPSLTH NSSGLLSPLR KKPLEDLVCK LADISINYVN ERKSEQHlRF LSTLLDSFSS  
SRVFKMLLGD EKQSIvQAKP LEIAKLvQKN PAVQFLYQKL IGWLNEdQRK DFGFLVDILY SALRCCDNdM

-1 ORF (SEQ ID NO: 111)

MVLRKLSKkd VTTKLKAMQE FGTMCterDt ETVKGVLPYw PRIFCKISLD HRRVREAtQ QAFekLTlKv KKQLAPYlKS  
LMGYWLMAQC DTYTPAAFAA KDAFEAAFPp SKQPEAIaFc KDEITSVLQD HLIKETPDTL SDPQTVPeeE REAKFYRVVt  
CSLLALKRLL CLLPDnELDS LEEKFKSLLS QNKFWKYGKH SVPQIRsAYf ELVSALCQRI PQLMKEEaSk VSPSVLLSiD  
DSDPIVCPAL WEAVLYTLTt IEDCWLHVNA KKSvFPKLST VIREGGRGLA TVIYPYLLPF ISKLPHSiTn PKLDFFKnfL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHqGL FNHLAETLSS  
WEAKADTEKD EKTAHNLEnv LIHFWERLSE ICvAKISEPE ADVESVLGVS NLLQVLQKPK SSKSSKKKkM VRLDLLMRYL  
KAIKRMKNVY LQKERRLKAG N\*

-2 ORF (SEQ ID NO: 112)

MVLRKLSKkd VTTKLKAMQE FGTMCterDt ETVKGVLPYw PRIFCKISLD HRRVREAtQ QAFekLTlKv KKQLAPYlKS  
LMGYWLMAQC DTYTPAAFAA KDAFEAAFPp SKQPEAIaFc KDEITSVLQD HLIKETPDTL SDPQTVPeeE REAKFYRVVt  
CSLLALKRLL CLLPDnELDS LEEKFKSLLS QNKFWKYGKH SVPQIRsAYf ELVSALCQRI PQLMKEEaSk VSPSVLLSiD  
DSDPIVCPAL WEAVLYTLTt IEDCWLHVNA KKSvFPKLST VIREGGRGLA TVIYPYLLPF ISKLPHSiTn PKLDFFKnfL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHqGL FNHLAETLSS  
WEAKADTEKD EKTAHNLEnv LIHFWERLSE ICvAKISEPE ADVESVLGVS NLLQVLQKPK SSKSSKKKk W\*

+ 1 ORF (SEQ ID NO: 113)

MVLRKLSKkd VTTKLKAMQE FGTMCterDt ETVKGVLPYw PRIFCKISLD HRRVREAtQ QAFekLTlKv KKQLAPYlKS  
LMGYWLMAQC DTYTPAAFAA KDAFEAAFPp SKQPEAIaFc KDEITSVLQD HLIKETPDTL SDPQTVPeeE REAKFYRVVt  
CSLLALKRLL CLLPDnELDS LEEKFKSLLS QNKFWKYGKH SVPQIRsAYf ELVSALCQRI PQLMKEEaSk VSPSVLLSiD  
DSDPIVCPAL WEAVLYTLTt IEDCWLHVNA KKSvFPKLST VIREGGRGLA TVIYPYLLPF ISKLPHSiTn PKLDFFKnfL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHqGL FNHLAETLSS  
WEAKADTEKD EKTAHNLEnv LIHFWERLSE ICvAKISEPE ADVESVLGVS NLLQVLQKPK SSKSSKKKk W\*

KIAA1052, A11 Pos. 689, Mut.rate 42.2%

Wt ORF (SEQ ID NO: 114)

MAGRPLRIGD QLVLEEDYDE TYIPSEQEIL EFAREIGIDP IKEPELMWLA REGIVAPLPg EWKPCQDITG DIYYFNfANG  
QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKKEKkd KKDRDPpKSS LALGSSLAPV HVLPGGLAPL RGLVDTPPSA  
LRGSQSVSLG SSVESGRQLG ELMLPSQGLK TSAYTKGLLG SIYEDKTALS LLGLGEETNE EDEEESDNQS VHSSEPLRN  
LHLDIGALGG DFEEYESLRT SQPEEKDdVS LDSDAAGPPT PCKPSSPGAD SSLSSAVGKG RQGSGARPGl PEKEENEKSE  
PKICRNlVTP KADPTGSEPA KASEKEAPED TVDAGEEGSR REEAaKEPKK KASALEEGSS DASQELISE HMKEPQLSDS  
IASDPKSFHG LDFGFRSRIS EHLLDvDVLs PVLGGACRQA QQPLGIEDKd DSQSSQDELQ SKQSKGLEER YHRLSPPLPH  
EERAQSPPRS LATEEEPPQG PEGQPEWKEA EELGEDSAAS LSLQLSLQRE QAPSPPAACE KGKEQHSQAE ELGPGQEEAE  
DPEEKVAVSP TPPVSPEVRS TEPVAPPEQL SEaALKAMEE AVAQVLEQDQ RHLLESKQEK MQQLREKLCQ EEEEEILRLH  
QQKEQSLSSL RERLQKAIEE EEARMREEES QRLSWLRAQV QSSTQADEdQ IRAEQEASLQ KLREELESQQ KAERASLEQK



**FIG. 2-8**

NRQMLEQLKE EIEASEKSEQ AALNAAKEKA LQQLREQLEG ERKEAVATLE KEHSAELERL CSSLEAKHRE VVSSLQKKIQ  
 EAQQKEEAQL QKCLGQVEHR VHQKSYHVAG YEHELSSLLR EKRQEVEGEH ERRLDKMKEE HQQVMAKARE QYEAERKQR  
 AELLGHLTGE LERLQRAHER ELETVRQEQH KRLEDLRRRH REQERKLQDL ELDLETRAKD VKARLALLEV QEETARREKQ  
 QLLDVQRQVA LKSEEATATH QQLEEAQKEH THLLQSNQQL REILDELQAR KKLKESQVDL LQAQSQQLQK HFSSLEAEAQ  
 KKQHLLREVT VEENNASPHF EPDLHIEDLR KSLGTNQTKE VSSLSQSKE DLYLDSLSSH NVWHLLSAEG VALRSAKEFL  
 VQQTRSMRRR QTALKAAQQH WRHELASAE VAKDPPGIKA LEDMRKNLEK ETRHLDKMS AMRKGNLLK KKEEKLNLQLE  
 SSLWEEASDE GTLGGSPKK AVTFDLSDMD SLSSSESSEF SPPHLDSTPS LTRKIHGLS HSLRQISSQL SSVLSILDSL  
 NPQSPPLLA SMPAQLPPRD PKSTPTPTY GSLARFSALS SATPTSTQWA WDSGQGPRLP SVAQTVDDF LLEKWRKYFP  
 SGIPLLSNP TPLESRLGYM SASEQLRLQ HSHSQVPEAG STTFQGIIEA NRRWLERVKN DPRLPLFSST PKPKATLSLL  
 QLGLDEHNRV KYYRF\*

**- 1 ORF (SEQ ID NO: 115)**

MAGRPLRIGD QLVLEEDYDE TYIPSEQEL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYNFNANG  
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKRKRKT RRTETPPKVR WPWVPH\*

**- 2ORF (SEQ ID NO: 116)**

MAGRPLRIGD QLVLEEDYDE TYIPSEQEL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYNFNANG  
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKGKERQ EGQRPPQKFA GLGFLISPSS CSSWGPGSFT RSCGYPTLCS  
SWISKREPG LSGVWTSARW THAAFTGSQD LCLYKGSGLHI\*

**+ 1 ORF (SEQ ID NO: 117)**

MAGRPLRIGD QLVLEEDYDE TYIPSEQEL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYNFNANG  
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKGKERQ QEGQRPPQKF AGLGFLISPS SCSSWGPGSF TRSCGYPTLC  
SSWISKREPG ELSGVWTSARW RTHAAFTGSQ DLCLYKGSGLG LHI\*